



Surgeon General's Office

LIBRARY

Section,

fevers - general

No. 21794

Thomas Gacki M.D.
from *Anton*
Reatto

REFLECTIONS ON FEVER,

AND PARTICULARLY ON THE

INFLAMMATORY CHARACTER

OF

F E V E R.



BY

LYMAN SPALDING, M. D.



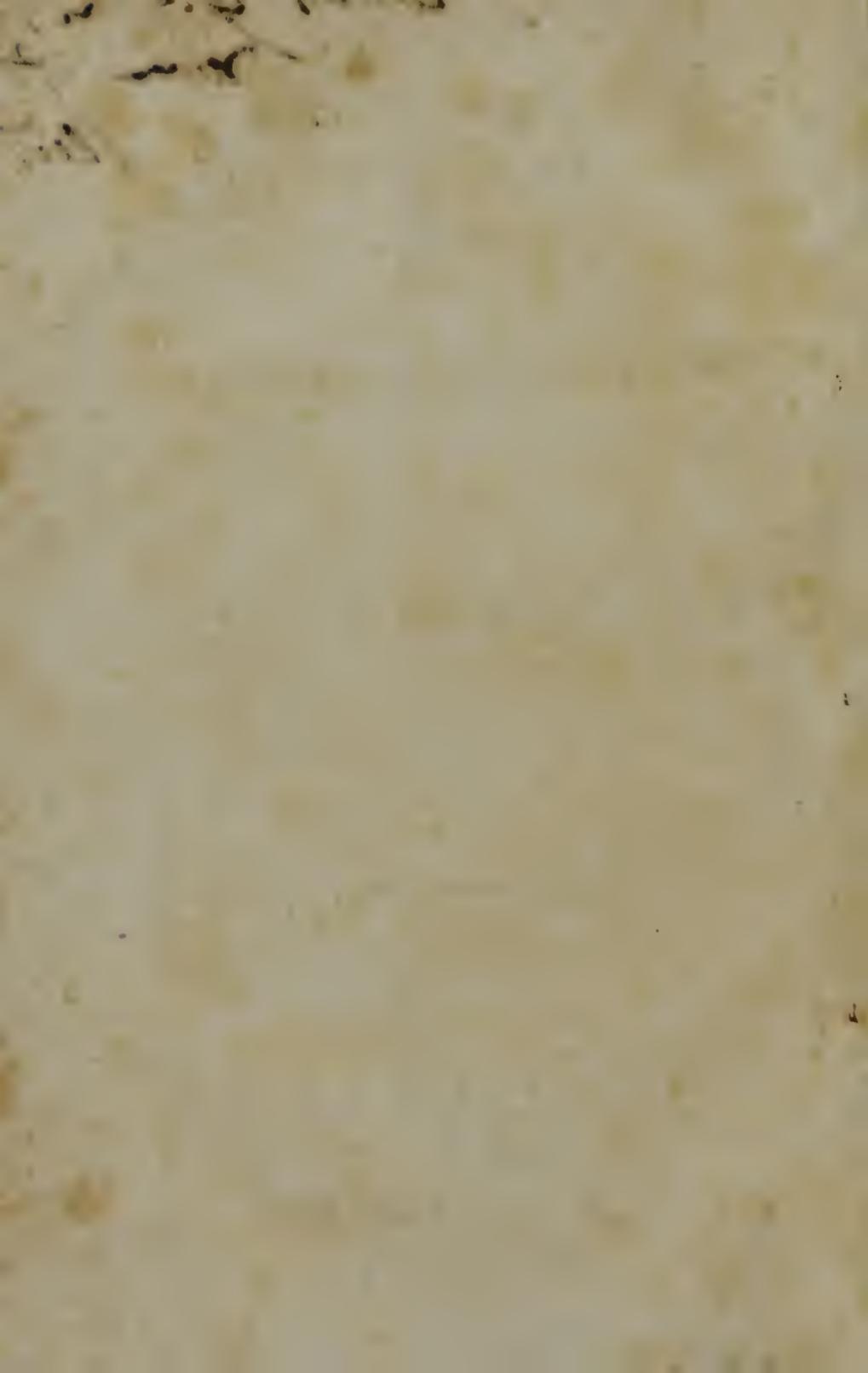
21794

NEW-YORK:

C. S. Van Winkle, Printer.

.....

1817.



REFLECTIONS ON FEVER, &c.*

FROM the first dawn of medical science, nosological arrangement of diseases has been the favourite pursuit of most medical philosophers. It has been the fortune of the immortal Rush to sap this baseless fabric, and to prove, that nosology is even worse than useless.

"I have said," says Rush,† "that there is but one fever; of course, I do not admit of its artificial divisions into genera and species. A disease which so frequently changes its form and place, should never have been designated, like plants and animals, by unchangeable characters. The oak tree, and the lion, possess exactly the same properties which they did nearly six thousand years ago. But, who can say the same thing of any one disease? Again; the oak tree has not united with any of the trees of the forest, nor has the lion imparted his specific qualities to any other animal. But, who can apply similar remarks to any one disease?"

Diseases have been variously classed by nosologists. PIREXIAE, however, have always claimed their first attention. This class has been differently divided, but always including the order *febres*, with genera, species, varieties, &c. making from two to eighty different kinds of fever.

We abandon nosology, because its arrangements are *immutable*, and altogether *artificial*; while disease is *changeable* by ten thousand varieties in age, sex, condition, climate, occupation, &c. and by no means capable of being circumscribed by *artificial* classification.

* This is an abridgement of one of the chapters of the Institutes and Practice of Medicine announced in volume III. of the Medical Repository, new series.

† Rush's Medical Inquiries, Vol. III. p. 33.

We believe, with Doctor RUSH, that there is but one fever; or, that fever is a unit; but, then, it consists of three grand, imperial, overruling characters, which almost amount to so many separate and distinct fevers.

These are the INFLAMMATORY, the TYPHOID, and the MIASMATIC characters of fever; in each of which, the seat, the cause, the symptoms, and the mode of cure, if not diametrically opposed, at least, differ very essentially from the other: and it is for these reasons, but principally because the method of cure differs so essentially, that we make this division into characters.

No apology is necessary for using the terms inflammatory and typhoid characters of fever; but the miasmatic character is a new term in medicine; we think, however, that no objections will be made to this term, when properly explained.

By fever of an inflammatory character, we mean the synocha, the causus of authors; and all those cases of fever, in which the inflammatory symptoms shall be paramount to the typhoid, or the miasmatic.

By fever of a typhoid character, we mean the typhus, the putrid, the malignant, the nervous fever of authors; and all those cases of fever in which the typhoid symptoms shall be paramount to the inflammatory, or the miasmatic.

By fever of a miasmatic character, we mean the intermittent, the remittent, &c. of authors; and all those cases of fever in which the intermittent or remittent symptoms, arising from marsh effluvia, shall be paramount to the inflammatory or typhoid.

Our arrangements will then, at once, be seen to be founded in practice, and on the essential characteristics of fever.

The inflammatory character of fever is liable to be blended in endless proportion with the typhoid character, till there shall be so nice an equilibrium between the two, as to render it impossible to say whether the fever partakes most of the inflammatory or typhoid character.

The same thing may be said of the blending of the inflammatory character with the miasmatic; of the typhoid with the inflammatory, and with the miasmatic; of the miasmatic with the inflammatory, and with the typhoid;

5

and it is from this blending and mixing of these three overruling characters of fever, that arise all the genera species, and varieties of fever described by nosologists. Always bearing in mind, however, that the seat, and remote cause of the disease; the constitution, age, sex, condition, and occupation of the patient; the climate, season, and a thousand other incidental circumstances, have an influence upon all diseases.

OF THE INFLAMMATORY CHARACTER OF FEVER.

Our plan for investigating the inflammatory character of fever will be,

1. To describe the disease.
2. To divide the description into stages, suits of symptoms, symptoms, groups of symptoms, &c.
3. To trace each symptom to its source, origin, or seat in some part of the body.
4. By induction, to assign to each symptom its proximate or efficient cause.
5. To examine the symptoms in the order of effect to cause, i. e. from the last to the first, and see if they constitute one continued chain of cause and effect.
6. To assign a seat to the disease itself.
7. By induction, to assign the proximate cause of the inflammatory character of fever.
8. To treat of the cure of fever.
9. To remark on the cure of the inflammatory character of fever.

That we may not be accused of describing this character of fever in our own way, and then explaining the phenomena which we may choose to set down, and thus evade the difficult part of the investigation, we shall select from the books the best description we can find.

We have chosen Thomas's description of the inflammatory fever, or synocha,* for our investigation; because it is the most accurate account we could find in the

*Hosack's edition of the Modern Practice of Physic, by Robert Thomas, p. 36. sec. 3.

books ; and the symptoms are arranged in the order in which they arise.

"It comes on with a sense of lassitude and inactivity, succeeded by vertigo, rigors, and pains over the whole body, but more particularly in the head and back ; which symptoms are shortly followed by redness of the face, throbbing of the temples, great restlessness, intense heat, and unquenchable thirst, oppression of breathing, and nausea. The skin is dry and parched, the eyes appear inflamed, and are incapable of bearing the light ; the tongue is of a scarlet colour at the sides, and furred and white in the centre ; the urine is red and scanty, the body is costive, and there is a quickness, with a fullness and hardness of the pulse, not much affected by any pressure made on the artery. Its pulsations are from 90 to 130 in a minute, and when blood is drawn, it exhibits a yellowish or buffy crust on its surface. If the febrile symptoms run very high, and proper means are not used at an early period, stupor and delirium come on at a more advanced stage ; the imagination becomes much disturbed and hurried, and the patient raves violently."

This description of the inflammatory character of fever naturally resolves itself into two stages.

First, the stage of morbidly diminished action, or debility ; corresponding with the cold stage of Doctor Cullen.

Second, the stage of morbidly increased action, corresponding with the hot stage of that author.

The first stage, morbidly diminished action, which is thus described : [I.] *It comes on with a sense of lassitude and inactivity, [II.] succeeded by vertigo, rigors, and pains over the whole body, but more particularly in the head and back ;* is divisible into two suits of symptoms.

I. The first suit, [1] *It comes on with a sense of lassitude [2] and inactivity,* is composed of two distinct symptoms ; the first of which is lassitude.

As much depends on a right understanding of the terms used, and as we shall lay much stress upon the word *lassitude*, we shall be excused, if we endeavour to ascertain its exact meaning, when used in medical language.

Motherby, we presume, is good authority, and he, in his Medical Dictionary, says expressly, that lassitude is

muscular debility ; and in this definition he is supported by most of the celebrated lexicographers.

Every writer on physiology and medicine has either alluded to this state of lassitude in the system, or directly described it. Many of them say that lassitude is peculiar to muscular structure ; all agree that muscular structure is liable to it.

We think then there is no doubt, that by lassitude is meant *muscular debility*.

Our next point to establish will be, that lassitude is the *first symptom* in the inflammatory character of fever.

In proof of this position, beside the authority of Thomas, we have that of Burserius, Cullen, Rush, Fordyce, Brown, Wilson, and a host of others, as well as the concurrent testimony of every practical physician.

Evidence that lassitude is seated in the muscular structure.

So far as we know, the muscular structure is the only part of the body which is liable to the sensation of lassitude, weariness, or fatigue. Certainly, the bones are not liable to this sensation ; neither is the skin, cellular substance, absorbent system, nor the viscera which have no muscular structure, as the liver, spleen, kidneys, &c. We do not know that the nerves themselves are subject to the sensation of lassitude.

When a person has exercised his muscles continually in walking, or labouring for a length of time, he feels a sense of lassitude, i. e. he is wearied, fatigued, tired. He feels an unwillingness to move, the muscles often swell, and become painful to the touch. No one, so far as we know, ever attributed the seat of this sensation to the structure of the nerves themselves ; because, at this time, sensation is acute ; reflection, vivid ; volition, agreeable ; but the muscles, from over exercise, show an unwillingness to obey the commands of the will ; and even when these commands are obeyed, there is a painful sensation in the substance of the muscles themselves.

We have every evidence in the world, then, that muscular structure is the seat of this sensation.

1st. The common consent of lexicographers in defining lassitude to mean muscular debility.

2d. The proof that muscular structure is liable to lassitude.

3d. The direct proof that lassitude is seated in the muscles.

4th. That no other structure of the body is liable to this sensation.

We will now allude to the several component parts of muscular structure, and ascertain which particular part is liable to the sense of lassitude, so that we can locate this symptom more definitely.

A muscle is composed of absorbents, cellular substance, blood-vessels, nerves, muscular fibres, &c.

The absorbent and cellular systems are not the seat of lassitude; neither are the blood-vessels nor nerves; but that it is seated in the muscular fibre we infer,

1. From the fibre being the peculiar substance which distinguishes muscular structure from all other parts of the body.

2. From those peculiar functions of the muscles, contraction and relaxation, whence may arise lassitude, residing in the muscular fibre itself.

3. From none other of the component parts of muscular structure being liable to this sensation.

We have, then, traced this first symptom in the inflammatory character of fever, lassitude, to its particular seat, *the fibrous structure of the muscular system*.

Our next business will be to assign the proximate cause of lassitude.

To enable us to attempt this with any probability of success, we must examine not only the functions, morbid actions, and vitiated actions of muscular fibres, but also of the nerves and blood vessels which enter into the composition of muscular structure.

To render muscular fibres fit to perform their functions, it is necessary that they should possess,

1. Life.

2. That they should be supplied with nerves.

3. That they should be supplied with red arterial blood.

4. That they should possess, in a state of integrity, the several parts which enter into the composition of a muscle.

We shall not speculate on the matter of life; but consider it by its properties, its effects on the body, by which animated matter is distinguished from inanimate.

Upon duly considering the functions of the nerves, it is apparent that they cannot cause the sense of lassitude experienced in the muscles, at the commencement of the inflammatory character of fever. The same result will follow on an examination of the functions of the red arterial blood. It is presumed that the muscles possess an integrity of structure; therefore, it is not necessary to investigate particularly this subject.

We will now enter upon the consideration of the functions of the muscular fibre itself; since neither the nerves, blood-vessels, nor other component parts of the muscle, are capable of producing that lassitude, which exists at the commencement of the inflammatory character of fever.

The functions of the muscular fibres are contraction and relaxation.

These functions are liable to be increased and diminished; but neither this increased nor diminished action passes the bounds of health; therefore, neither of them can produce that lassitude, incident to the inflammatory character of fever.

The contractions and relaxations of the muscular fibres are liable to morbidly increased and morbidly diminished action.

In Thomas's description of the inflammatory character of fever, the FIRST STAGE is *not* morbidly increased action; therefore, we need not compare the lassitude of that stage with the class of morbidly increased actions of the muscular fibres.

We will, then, compare the morbidly diminished action of the muscular fibres, with the lassitude in the inflammatory character of fever, and see in what manner they will correspond.

The contractions and relaxations of the muscular fibres are liable to morbidly diminished action, while the life of the fibre remains in its common state.

1. By the influence of the brain and spinal marrow upon the nerves being inordinately small.

2. By sedative applications.

These contractions and relaxations are liable to morbidly diminished action, while the influence of the brain and spinal marrow upon the nerves is in its common state;

By a very great diminution of the life of the muscular fibre itself.

It is evident that the life of the muscular fibres, in the commencement of the inflammatory character of fever, is not diminished by the influence of the nervous system, nor by that of the sanguiferous system; because in both cases, this would require some change to have taken place in the system, before lassitude appeared, which is not the fact.

In what manner can the life of the muscular fibres be diminished, but through the medium of the nervous, or circulating system?

By any cause whatever, which is capable of producing a powerfully debilitating effect upon the muscular fibres themselves; such as sedatives in general, and cold in particular.

Cold, to produce its most powerful effects upon the muscular fibres, must have been preceded by heat; and the effects produced are always in proportion to the difference of temperature, and the suddenness of the change.

Every person knows, that if, after violent exercise and much heat, he set himself down in a cool place, where there is a current of air, that the life of the muscular fibres will be so changed that the muscles will scarcely be able to contract.

No one would presume that there was, in this case, any previous change in the nervous or circulating system, which thus diminished the action of the muscles. No, it is the effect of the change of temperature upon the life of the muscular fibres. Every person knows that it is the muscles themselves, which thus become stiff; and unless a more serious disease is to follow, that they will become limber again by a little exercise.

We think that we have fully proved, that cold, i. e. a sudden change from a high to a low temperature, can greatly diminish the life of the muscular fibres, so as to produce lassitude and inactivity; therefore, *this very great diminution of the life of the muscular fibres*, we con-

sider as the proximate cause of the sense of lassitude, in the commencement of the inflammatory character of fever.

We are supported in this opinion.

1. From a knowledge that the life of the muscular fibre is liable to a very great diminution.

2. That this diminution will produce lassitude.

3. That no other circumstance occurs at the commencement of the inflammatory character of fever, which could cause lassitude ; since neither the nervous nor circulating system is primarily affected.

4. That this diminution of the life of the muscular fibres may be caused by cold ; and cold generally precedes every attack of the inflammatory character of fever.

We will now consider the second symptom of the first suit, viz :—

2. Inactivity.

Inactivity is sluggishness, unwillingness to move, which is always the case when a person is tired or fatigued.

It is so perfectly plain, that this symptom is also seated in *the fibrous structure of the muscular system*, that it is unnecessary to make any examination.

The proximate cause of inactivity is the same as that of lassitude, *a very great diminution of the life of the muscular fibres.*

II. The second suit of symptoms, [1] succeeded by vertigo, [2] rigors, [3] and pains over the whole body, but more particularly in the head and back, consists of three distinct symptoms.

1. Succeeded by vertigo.

Vertigo, Motherby says, is (swimming of the head,) in which the head seems to turn, or at least all things about the patient seem to do so.

The brain is the seat of sensation, and the nerves and blood-vessels the media by which impressions are made on the brain itself. It is not very probable that vertigo arises from the nerves ; we will therefore examine what changes of circulation in the brain can produce it. It is well known that the suddenly taking off a distention from the brain will often produce vertigo ; as raising up the head suddenly after having held it

down for some time. The bleeding from a large orifice while the person stands erect, &c. Then the want of the accustomed stimulus of distention of the brain, by blood, will produce vertigo.

We have traced this symptom to its seat, *the brain*; its proximate cause, *a diminished circulation in the substance of the brain itself*.

2. *Succeeded by rigors.*

Rigour, [rigor, Latin,] a convulsive shuddering, with sense of cold, says Johnson.

This symptom is resolvable into two parts.

1. The sense of cold.

2. The convulsive shuddering.

Cold is a sensation which arises in the brain, in consequence of a certain impression being made on the sentient extremities of the nerves. The sensation produced in the brain does not always correspond with the real temperature of the part; because the influence of the nerves is liable to be changed; and that function of the brain, which is to receive impressions from the nerves, is also liable to be changed; therefore, the sensation produced may be less than the impression.

The sensation of cold is plainly referrible, by the patient himself, to the deep-seated parts beneath the integuments of the body. Chilled through, is a common expression.

We have already shown that lassitude, a previous symptom, consists in the great diminution of the life of the fibrous structure of the muscles; which diminution affects or vitiates the sentient extremities of the nerves that are spent upon the muscles, thereby producing the sensation of cold.

From the very definition of the term rigor, a convulsive shuddering with sense of cold we should say that this symptom must be seated in the muscles, as they are the only structure which is capable of convulsive action.

From all that precedes, it appears perfectly plain, that the seat of rigors is *the muscular structure*; and it is equally evident, that *the very great diminution of the life of the muscular structure* is its proximate cause.

3. Pains over the whole body, but more particularly in the head and back.

When all the functions of the body are duly performed, so easy, agreeable, and pleasant is sensation, that we are scarcely conscious of our existence ; but the moment any function is illly performed, then come pains, aches, and a train of woes which fully remind us of our frail state.

There is no difficulty in tracing the seat of this symptom to the *muscular structure itself*. The slightest motion aggravates all the pains, and convinces the patient that the moving powers are affected. In fact, the muscles feel sore to the touch. No person could expect them to remain free of pain, since their life has been almost destroyed.

Proximate cause. A very great diminution of the life of the muscular fibres.

Since the stomach is muscular, and very powerfully affected in the onset of fever, we presume that the nervous connexion which exists between that organ and the back of the head and neck, by means of the par vagum and spinal accessory nerves, the intercostal and cervicals, will account for the pains being particularly located in that place.

SECOND STAGE.—The stage of morbidly increased action, or the hot stage, is divisible into three suits of symptoms.

I. Suit; [1] which symptoms are shortly followed by redness of the face, [2] throbbing of the temples, [3] great restlessness, [4] intense heat, [5] and unquenchable thirst, [6] oppression of breathing, [7] and nausea.

This suit is composed of seven distinct symptoms.
1. Which symptoms are shortly followed by redness of the face.

The increase of colour of the surface of the body is so evidently dependent on an accumulation of the blood in the minute arterial ramifications, that no investigation becomes necessary, to assign the *circulating system* as the seat of this symptom.

The proximate cause is equally evident, *morbidly increased action of the circulating system*, particularly of the minute arterial ramifications.

2. Throbbing of the temples.

The seat of this symptom is clearly in the *arterial system*; for it is the temporal arteries which beat, and the superficial branches may even be seen beating with the naked eye.

The proximate cause, *morbidly increased action of the circulating system.*

3. Great restlessness.

By this we understand a restless uneasy sensation, accompanied with a desire to move. The patient feels the time gone through infinitely long; a minute seems to him more than an hour; he cannot fix his attention on any object; he does not lie easily, and finds no relief in changing his posture.

Doctor Fordyce says, there are two causes of this great restlessness; the one an accumulation of blood about the heart; the other, a distension of the small vessels throughout the system.

Then we have no difficulty in locating this symptom in the *circulating system*. Its proximate cause, *morbidly diminished action*, when it arises from an accumulation of blood about the heart; *morbidly increased action*, when it arises from a distension of the collapsed vessels.

4. Intense heat.

This is a very important symptom, no less so than to have given name to fever; for Galen defines fever, preternatural heat. But, he says, the principal, and, as it were, pathognomonic symptoms are, the ardent heat and excessive thirst.

I believe it will not be doubted that the *circulating system* is the seat of this symptom, and that its proximate cause is *morbidly increased action* in that system.

5. And unquenchable thirst.

Thirst arises from a heat, dryness, parchedness, clamminess, or peculiar irritation of the mouth and fauces. The seat of this symptom is apparent, *the mouth and fauces*. If we choose to ferret out this symptom in its hiding places, and to locate it more definitely, we should find no difficulty in pursuing it to the minute arterial ramifications.

The proximate cause of thirst, whatever can produce a heat, dryness, &c. in the mouth and throat. In-

tense heat, and that of a morbid kind, will certainly produce all these effects. We have already examined the production of this heat, and such is the affinity between the mucous membrane of the mouth and throat, and the other parts of the body, particularly the skin, that whatever produces intense heat on the surface, or throughout the whole body, must of course produce it in the mouth and fauces; hence there can be no hesitation in assigning as the proximate cause of this symptom, *morbidly increased action of the circulating system.*

6. Oppression of breathing.

That a hurried circulation is capable of producing oppression of breathing, will be perfectly evident to any one who will exercise violently for a few minutes. No doubt, the oppression of breathing, in fever, will differ somewhat from that which arises from violent exercise; because, in the former case, the muscles of respiration, the lungs themselves, and every part of the body, are labouring under disease, and no part performs well its functions; while, in the latter case, the whole body is supposed to be in health.

This symptom is evidently seated in *the lungs*; and its proximate cause is *morbidly increased action of the circulating system.*

7. And nausea.

Nausea is a less degree of the same action, which produces vomiting. Vomiting is an inversion of the action of the pharynx, œsophagus, and stomach, by which the contents of the stomach are discharged by the mouth. Nausea is a less degree of inversion, or rather a tendency to an inversion, in which the contents of the stomach are not discharged, but there is a disposition to vomit.

Vomiting, and of course nausea, are opposed to the common function of the œsophagus, deglutition, which is performed by the natural and successive contractions of the fibres of the muscular coat of the pharynx and œsophagus.

Nausea being a disposition to an inversion of the regular action of the œsophagus and pharynx, there is no difficulty in tracing this symptom to its seat, in *the muscular coat of the stomach, œsophagus, and pharynx.*

Vomiting and nausea are well understood to arise from the exhibition of emetic drugs, which diminish the life of the muscular membrane of the stomach, œsophagus, and pharynx; from any cause whatever, which shall produce a great diminution of the life of this muscular membrane; from offending matters in the stomach, &c.

Then the proximate cause of nausea, in the inflammatory character of fever, may be either *a very great diminution of the life of the muscular coat of the stomach, œsophagus, and pharynx; or an accumulation of offending matters in the stomach.*

The diminution of the life of the muscular coat of the stomach, œsophagus, and pharynx may arise from the same cause which produces the diminution of the life of the muscles in lassitude. This is probably the proximate cause of nausea, when it arises as an early symptom of fever; but when it comes on later, it is probable that the returning sensibility of the muscular coat of the stomach, (from the return of the circulation,) is operated upon by the offending matters in the stomach.

II. The second suit of symptoms in the second stage of morbidly increased action.

[1] *The skin is dry [2] and parched; [3] the eyes appear inflamed, [4] and are incapable of bearing the light; [5] the tongue is of a scarlet colour at the sides, and furred, and white in the centre; [6] the urine is red and scanty, [7] the body is costive, [8] and there is a quickness, with a fullness and hardness in the pulse, not much affected by any pressure made on the artery. [9] Its pulsations are from 90 to 130 in a minute, [10] and when blood is drawn, it exhibits a yellowish or buffy crust on its surface.*

This suit is composed of ten distinct symptoms.

1. *The skin is dry.*

The skin is kept moist by a fluid, thrown out by the exhalent arteries, and called insensible perspiration.

The functions of the exhalent arteries are liable to morbidly increased action, producing very profuse sweat; and morbidly diminished action, giving a very dry skin. The seat of this symptom does not admit

of a doubt ; *the exhalent arteries*, which are a continuation of the arterial system.

The proximate cause is, *morbidly diminished action in the exhalent arteries*, arising from the cold stage of the fever.

2. *The skin is dry and parched.*

By a parched skin is meant, a skin that is dry, and has a peculiar heat upon it. We have just shown that a dry skin is referrible to the exhalent arteries ; and we have before traced the source of animal heat to the circulating system ; therefore, this symptom is evidently situated in *the circulating system*. The proximate cause is, a *diminution of perspiration*, from the exhalent arteries not having yet recovered their vigour ; and an increase of heat of a peculiar nature, arising from a morbid increase of circulation.

3. *The eyes appear inflamed.*

Inflammation is a well-known effect of the circulation ; therefore, it requires no investigation on our part to locate this symptom in *the circulating system*. Its proximate cause is equally well understood, *morbidly increased action*.

4. *And are incapable of bearing the light ;*

This is well known to be the effect of inflammation, and is therefore referrible to the same seat and cause as the last symptom.

5. *The tongue is of a scarlet colour at the sides, and furred, and white in the centre.*

We have already shown that unquenchable thirst, one of the preceding symptoms, arises from a heat, dryness, parchedness, clamminess, or peculiar irritation of the mouth and fauces. The tongue, as composing a part of the mouth, is instrumental in producing the unquenchable thirst. The proximate cause of thirst is, increased action of the circulating system. We presume that the changes in the tongue may likewise be referred to the circulation ; because the tongue has a disposition to be furred whenever the circulation is irregular, although fever may not be present, and the red colour of every part of the body is owing to the blood. But I confess myself too ignorant of the pathology of those changes in the tongue, to be able to trace them to their particu-

lar seat, or to assign to them any proximate cause which shall be satisfactory.

The seat of this symptom is *the tongue*; and its proximate cause, is probably referrible to *the circulating system*.

6. *The urine is red and scanty.*

All the secretions are from the blood, and are more or less under the influence of the circulation. It is a well-known fact, that when the circulation is weak and languid, that the urine is copious and light coloured; but when the circulation is brisk and active, the urine is in less quantity, and of a higher colour. It is not necessary then to go into a minute physiological investigation of the secretion of urine, as we presume no one will doubt that *the kidneys, particularly their secretory arteries*, are the seat of the symptom, and that the proximate cause is, *morbidly increased action of the circulating system*.

7. *The body is costive.*

The seat of this symptom is apparent, the alimentary canal. One function of this canal is to discharge the fæces at regular periods. In order to the due performance of this function, it is necessary that the lower bowels should be properly lubricated by the secretions from the mucous glands, situated in the coats of the alimentary canal; by the glands situated without the coats, but whose ducts enter the canal; and by the exhalations from the exhalent arteries, which open into the canal.

These secretions and exhalations are liable to be increased, diminished, &c. When increased, the contents of the lower bowels are augmented, and purging follows, either from the stimulus of distention, or from the irritation of the feculent matter. On the other hand, when these secretions and exhalations are diminished, the contents of the lower bowels are not augmented as usual; therefore, the stimulus of distention does not occur at the regular period, the irritation of the feculent matter is not so great as usual, and from the want of lubricity, the contents do not so readily pass down; hence costiveness.

The seat of costiveness is the *alimentary canal*; the proximate cause, diminished secretion and exhalation; which arise from the morbidly diminished action of the

circulating system that existed in the first stage of the fever. It scarcely need be said, that the secretions and exhalations are from the blood. Perhaps the very great diminution of the life of the muscular structure, which existed previously, prevents the ready action of the muscular membrane of the intestines.

8. And there is a quickness, with a fulness, and hardness in the pulse, not much affected by any pressure made on the artery.

The seat of this symptom is, *the heart and arteries*; the proximate cause, *morbidly increased action*.

9. Its pulsations are from 90 to 130 in a minute.

This symptom ought to have been connected with the last. It has the same seat and proximate cause.

10. And when blood is drawn, it exhibits a yellowish or buffy crust on its surface.

In our reflections on the blood* we think we have fully proved, that all the changes in the blood take place within the circulating system; and that the yellowish or buffy crust is produced by the morbidly increased action of the heart and arteries; particularly, by the muscular structure of the ventricles.

Then we shall assign *the heart and arteries* as the seat of this symptom; and their *morbidly increased action*, as its proximate cause.

III. The third suit of symptoms in the stage of morbidly increased action.

[1] *If the febrile symptoms run very high, and proper means are not used at an early period, stupor and delirium come on at a more advanced stage;* [2] *the imagination becomes much disturbed and hurried,* [3] *and the patient raves violently.*

This suit is composed of three distinct symptoms.

1. If the febrile symptoms run very high, and proper means are not used at an early period, stupor and delirium come on at a more advanced stage.

Stupor and delirium have their seat in the brain. On reference to the functions and actions of the brain, we find that stupor and delirium will arise from a long con-

* Contained in the Institutes and Practice of Medicine, not yet published.

tinuance of *morbidly increased action of the heart and arteries*, which is their proximate cause.

2. *The imagination becomes much disturbed and hurried.*

This symptom is in train with the last; it is a part of the same diseased action, and is clearly referrible to the same seat, the brain; and to the same proximate cause, *morbidly increased action of the heart and arteries*.

3. *And the patient raves violently.*

This is but one of the symptoms of delirium, and like that, is located in the brain, and has for its proximate cause, *morbidly increased action of the heart and arteries*.

Having assigned the seat and proximate cause to the several symptoms in the inflammatory character of fever, our next business will be to endeavour to ascertain the seat of the disease itself.

We shall now examine the several symptoms in the order of effect to cause, and see if we can find any one symptom, which can cause all the others; if so, whatever is the seat of this symptom must evidently be the seat of the disease. In this investigation, we shall commence with the last suit of symptoms in the disease, and attempt to trace up the several symptoms from effect to cause; and endeavour to generalize the seats and proximate causes of the several symptoms in each suit.

THIRD SUIT of symptoms in the SECOND STAGE. [1] *If the febrile symptoms run very high, and proper means are not used at an early period, stupor and delirium come on at a more advanced stage, [2] the imagination becomes much disturbed and hurried, [3] and the patient raves violently.*

This suit consists of three distinct symptoms, which we have traced to their seat, the brain, and shown the proximate cause of each to be morbidly increased action of the heart and arteries.

We will now refer to the next preceding suit of symptoms, and trace this morbidly increased action of the heart and arteries to its source.

SECOND SUIT of symptoms in the SECOND STAGE. [1] *The skin is dry, [2] and parched; [3] the eyes appear inflamed, [4] and are incapable of bearing the light, [5] the tongue is of a scarlet colour at the sides, and furred, and white in the centre; [6] the urine is red and scanty, [7] the*

body is costive, [8] and there is a quickness, with a fulness and hardness in the pulse, not much affected by any pressure made on the artery. [9] Its pulsations are from 90 to 130 in a minute. [10] and when blood is drawn, it exhibits a yellowish or buffy crust on its surface.

This suit consists of ten symptoms; eight of which have their seat in the circulating system, and their proximate cause is morbidly increased action of the heart and arteries. The other two are local symptoms, and have other seats; the proximate cause of the one is, probably, morbidly increased action of the heart and arteries; of the other, their morbidly diminished action, which previously existed in the system.

The first suit of symptoms in the second stage, will next engage our attention, while we keep in view this morbidly increased action of the heart and arteries, which appears to be the overruling state of the system in the third and second suits of symptoms.

[1] *Which symptoms are shortly followed by redness of the face, [2] throbbing of the temples, [3] great restlessness, [4] intense heat, [5] and unquenchable thirst, [6] oppression of breathing, [7] and nausea.*

This suit consists of seven distinct symptoms; of which, four are seated in the circulating system, and their proximate cause is morbidly increased action of the heart and arteries. The other three are local symptoms, and have other seats; but the proximate cause of two of them is referable, directly, to the morbidly increased action of the heart and arteries; and the third, indirectly, to the same source.

The morbidly increased action of the heart and arteries, then, is the overruling state of the system in the third, second, and first suits of symptoms, which constitute the second stage in the inflammatory character of fever.

We will now examine the second suit of symptoms in the first stage, with a view to ascertain the cause of this morbidly increased action of the heart and arteries, which appears to be the overruling state of the system in the second stage of the inflammatory character of fever.

[1] *Succeeded by vertigo, [2] rigors, [3] and pains over*

the whole body, but more particularly in the head and back.

This suit consists of three distinct symptoms; the first is seated in the brain, and the second and third, in the muscular structure. The proximate cause of the first is referable to a morbidly diminished action of the heart and arteries; of the second and third, to a very great diminution of the life of the muscular structure.

The symptoms of this suit are directly opposed to all those of the second stage. There, the overruling state of the system was the morbidly increased action of the heart and arteries; here, it is the morbidly diminished action of the same organs.

At first view, it would appear, that we had completely lost sight of our grand overruling state of the system, the morbidly increased action of the heart and arteries; but, such are the laws of the animal economy, that after the morbidly diminished action of the heart and arteries has continued for a time, the system reacts upon itself, and produces a morbidly increased action of that heart and arteries, which were, just before, labouring under a morbidly diminished action.

This law of the animal economy is acknowledged by all our best writers on medicine. It is called re-action. We shall examine it particularly hereafter.

The overruling state of the system in the second stage, then, is the effect of the morbidly diminished action of the heart and arteries in the second suit of symptoms of the first stage.

The first suit of symptoms in the first stage will now engage our attention, in order to ascertain the cause of this morbidly diminished action of the heart and arteries, which appears to be the overruling state of the system in the second suit of symptoms.

[1] *It comes on with a sense of lassitude [2] and inactivity.*

This suit consists of but two symptoms; both of which have the same seat, the fibrous structure of the muscular system; and both, the same proximate cause, a very great diminution of the life of the muscular structure.

The action of the heart and arteries, is produced by the muscular structure of the ventricles; consequently,

this morbidly diminished action of the heart and arteries must arise from the lassitude and inactivity, which, at the commencement of the inflammatory character of fever, pervade the muscular structure of the ventricles, in common with the whole of the muscular system.

From the preceding investigation, is it not perfectly evident, that the muscular structure must be the seat of the inflammatory character of fever?

This induction is drawn from the following considerations:

1. The first symptom, lassitude, is seated in the muscular structure.

2. All the other symptoms are mere effects, produced by the functions and morbid actions of muscular structure.

3. The two overruling states of the system, the morbidly diminished, and the morbidly increased action of the heart and arteries, which cause all the symptoms, after the two first, are referable directly to the muscular structure.

4. The symptoms, from the first to the last, are one continued chain of cause and effect, and are capable of being produced, by whatever causes the sense of lassitude.

5. In the examination of the symptoms from effect to cause, it has been clearly proved, that all the symptoms emanate from the derangement in the functions of the muscular fibre.

We have then traced the inflammatory character of fever to its seat, *the fibrous structure of the muscular system.*

Having located this character of fever, we shall endeavour to investigate its proximate cause.

"The proximate cause of fever seems hitherto to have eluded the research of physicians; and I shall not pretend to ascertain it in a manner that may remove every difficulty."*

It can hardly be expected that we should be successful in that which has eluded Dr. Cullen, and all the other great luminaries of medical science. We may, how-

* Cullen's First Lines, par. 33.

† First Lines, par. 34.

ever, be permitted to make an humble attempt, since we have laid a solid foundation, by assigning a seat to the inflammatory character of fever.

Doctor Cullen,† says, "As the hot stage of fever is so constantly preceded by a cold stage, we presume that the latter is the cause of the former; and, therefore, that the cause of the cold stage is the cause of all that follows in the course of the paroxysm; see Boerhaave, Aph. 756."

We have no doubt the doctor was correct in saying, that the cause of the cold stage is the cause of all that follows in the course of the paroxysm. And we believe we can go further, and say, that, whatever produces the first suit of symptoms, the sense of lassitude and inactivity, is the cause of all that follows in the course of the paroxysm.

We have examined Thomas's description of the inflammatory character of fever, in the order of effect to cause, and proved that all the effects may be produced by whatever causes the first suit of symptoms; and, that the train of symptoms is in reality cause and effect; it follows then, that whatever produces the first suit of symptoms, must be the proximate cause of this character of fever.

We have shown that lassitude is seated in the fibrous structure of the muscular system; and that its proximate cause is a very great diminution of the life of the muscular fibre.

We shall now examine the several symptoms in the inflammatory character of fever, by stages, and by suits and groups of symptoms, and endeavour to ascertain if a very great diminution of the life of the muscular fibre can produce all the symptoms.

The second symptom, in Thomas's description, is *inactivity*; this is well known to be the effect of lassitude.

Succeeded by vertigo. The seat of this symptom we have traced to the brain; its proximate cause is the morbidly diminished action of the heart and arteries.

We have now to inquire in what manner a very great diminution of the life of the muscular fibre can affect the circulation.

There is a certain consent, or unison of action, be-

tween similar parts, throughout the whole of every system of organs, or vessels, composing the human body; which is well known to physiologists, and is sometimes denominated sympathy.

Proof of this consent of parts.

Dr. Cullen* says, "that a certain condition prevailing in one part of the body, occasions a similar condition in the other."

The taylor, who has wrought all day with his needle, finds every muscle of his body fatigued and exhausted, even to his toes' ends, although he may not have moved from his seat for twelve hours. The pedestrian, who has walked for a long time, finds his superior extremities nearly as much fatigued as his inferior.

"If we fatigue one limb by violent exertions," says Wilson,† "we find that we have, though in a less degree, diminished the power of every other."

Point out to me a person who is tired all over his body, with the exception of one hand. Show me the man, exhausted with labour, who does not prefer silence to loquacity, although he may not have spoken ten words for the whole day. Where is the orator that can address an audience for six hours, and feel no fatigue, except in the organs of speech. Till this is done, we deem it unnecessary to adduce further evidence, in proof of our position.

Now, I presume, we are prepared to understand, that a sudden and great change of temperature, acting upon the surface, or any other part of the body, so as greatly to diminish the life of the muscular fibres of that part, may, and will, affect all the muscular fibres of every other part of the body; consequently, the muscular fibres of the ventricles will undergo a similar change in life with those primarily affected. And as the circulation corresponds very exactly with the muscular action of the ventricles; the effect of a very great diminution of the life of the muscular fibres of the ventricles of the heart, will be, a diminished, and probably, an irregular circulation of the blood.

A diminished circulation, is then precisely what must

* First Lines, par. 44. § 2.

† Febrile Diseases, Vol. I. p. 203.

follow as the effect of such a cause, for to lassitude and inactivity of the muscles, naturally succeed languor, sluggishness, and unwillingness to move, which is the condition, not with the ventricles alone, but with every part of the body.

Rigors. The seat of this symptom is the fibrous structure of the muscular system; its proximate cause, a very great diminution of the life of the muscular structure. This is a state of the system which we have already shown existed, and to which this symptom is referable.

Pains over the whole body, but more particularly in the head and back. This symptom has also been traced to the muscular system; and its proximate cause, to a very great diminution of the life of the muscular structure; and, therefore, referable to the same state of the system, as the last mentioned symptom.

We have then proved, that all the symptoms, in the first stage, may arise from a very great diminution of the life of the muscular structure, producing lassitude.

We will now examine the second stage, and see if it be possible, that the overruling state of the system, in this stage, a morbidly increased action of the heart and arteries, should arise from the previous stage of morbidly diminished action. We shall, at the same time, inquire if the several symptoms in the second stage can also be produced by this morbidly diminished action.

The first suit of symptoms in this stage is, [1] which symptoms are shortly followed by redness of the face, [2] throbbing of the temples, [3] great restlessness, [4] intense heat, [5] and unquenchable thirst, [6] oppression of breathing, [7] and nausea. Each of the symptoms in this suit has been traced to its source, and its proximate cause assigned. The 1, 2, 3, and 4, have their seat in the circulating system; and their proximate cause is morbidly increased action. The other three, 5, 6, and 7, are local symptoms, and have local seats; but their proximate cause is morbidly increased action of the circulating system. Then our whole attention, in this suit of symptoms, will be directed to the circulating system as the seat, and to morbidly increased action as the proximate cause.

The overruling state of the system in the **FIRST STAGE**, we have already proved to be the morbidly diminished action of the heart and arteries ; its proximate cause, a very great diminution of the life of the muscular structure. It would appear paradoxical, that this condition of the system should produce the overruling state of the system in the **SECOND STAGE**, the morbidly increased action of the heart and arteries.

It is not an easy matter to comprehend, in what manner a morbidly diminished action of the heart and arteries, should produce their morbidly increased action. But, to the fact, we have the testimony of almost every medical writer. Dr. Cullen expressly says, the hot stage of fever is caused by the cold stage.

The seat of the first suit of symptoms, in the second stage, being fixed in the circulating system, we have only to inquire in what manner a very great diminution of the life of the muscular structure can produce a morbidly increased action of the heart and arteries.

In another place,* we have shown that the arterial circulation is produced by the muscular contraction and dilatation of the ventricles of the heart, and wholly under its influence. Our wide field, then, is reduced to a single point. In what manner can a very great diminution of the life of the muscular fibres of the ventricles of the heart, characterized by a small and weak pulse, produce a morbidly increased action of the same fibres, which shall be characterized by a full and strong pulse ? This effect is what has been called **REACTION**. This principle has been acknowledged by all writers on medicine ; but we are not able to trace it to any of the well known laws of the animal economy.

The plain history of facts, without any varnishing, or reference to preconceived theory, so far as I understand it, is this : The general life of the whole body is borne down and oppressed by some cause, as in the stage of morbidly diminished action of the inflammatory character of fever, till it approximates that point where life must quit this mortal frame. This oppressing cause, however, is not generally equal to the extinction of life ;

* Institutes, not published.

and when the opposing cause has gone the full length of its power, the life of the system and the opposing cause remain, for a time, in equilibrium. At length the vitality of the system gains ground, and reacts upon the oppression, till it produces that train of symptoms denominated the stage of morbidly increased action.

Similitude proves nothing, or we might instance the reaction of a bow, a tense cord, elastic bodies, &c.

I would attempt to explain this principle of the animal economy in the following manner. The violence of the action of the proximate cause of fever produces a shrinking of the external parts of the body,* which forces the blood upon the heart and larger vessels. This unusual quantity of blood in the heart imparts more stimulus to its muscular structure, than what would be derived from the usual quantity of blood; or, perhaps, the mere over distention acts as a stimulant. The one, or both of these, may possibly have a tendency to reanimate the muscular fibres of the heart, and to relieve them from their very great diminution of life, and thus produce what is denominated the reaction of the system.

In fact, rest, friction, and the genial warmth of the arterial blood, are precisely what common sense would dictate as being the most likely to restore the very great diminution of the life of the muscular fibres. Since the heart is but secondarily affected, by the proximate cause, and not so powerfully as those muscles which shudder, we should suppose the heart would first regain its diminished life.

If this explanation of reaction be correct, of which we have but little doubt, then it will be seen that the hot fit follows the cold, in the order of cause and effect, as conjectured by Dr. Cullen.

We will give, in support of our opinion, a specimen of reaction, of a different kind from that which occurs in fever. In concussion of the brain, from whatever cause, there is universal prostration of strength; the pulse is scarcely perceptible, life seems just ready to quit her tenement. The cordial treatment becomes necessary to prevent immediate death. The system is roused; the

* Vide Cullen's First Lines, *par. 40.*

patient soon revives ; the pulse increases in force and fulness ; a high state of the inflammatory character of fever supervenes, and many bleedings, purgings, &c. are necessary to save the patient. Here is a powerful state of reaction, evidently produced by the previous state of depression.

Dr. Thomas, in his description, goes on to say, [1] *The skin is dry, [2] and parched, [3] the eyes appear inflamed, [4] and are incapable of bearing the light, [5] the tongue is of a scarlet colour at the sides, and furred, and white in the centre, [6] the urine is red and scanty, [7] the body is costive, [8] and there is a quickness, with a fulness and hardness in the pulse, not much affected by any pressure made on the artery, [9] its pulsations are from 90 to 130 in a minute, [10] and when blood is drawn, it exhibits a yellowish or buffy crust on its surface.* All the symptoms of this suit, with the exception of one or two, have been traced to their seat in the circulating system ; and their proximate cause proved to be morbidly increased action. This whole suit, then, is merely an effect of the existing morbidly increased action of the heart and arteries.

[1] *If the febrile symptoms run very high, and proper means are not used at an early period, stupor and delirium come on at a more advanced stage, [2] the imagination becomes much disturbed and hurried, [3] and the patient raves violently.* The seat of this suit of symptoms we have already shown to be the brain ; and the proximate cause, the morbidly increased action of the heart and arteries. Then it follows that Dr. Thomas's description is a connected chain of cause and effect ; and whatever produces the first symptom, may be considered as the proximate cause of the disease ; and it also appears that all the other symptoms are mere links in the same chain of cause and effect.

We have already proved that a very great diminution of the life of the muscular fibre will produce lassitude, and all the phenomena attending the stage of morbidly diminished action ; and that the natural tendency of this stage is to produce reaction, whence arises the stage of morbidly increased action, and all the train of symptoms which follow ; therefore, we infer, that a very great di-

minution of the life of the muscular fibre is the proximate cause of the inflammatory character of fever.

This deduction is supported from a knowledge,

1. That lassitude is seated in the muscular fibre.
2. That the proximate cause of lassitude is a very great diminution of the life of the muscular fibre.
3. That the inflammatory character of fever is seated in the muscular structure.
4. That a very great diminution of the life of the muscular structure will produce lassitude, and all the other symptoms in Thomas's description.
5. That no other individual cause can produce all those symptoms.

CURE OF FEVER.

In our reflections on the cure of fever, we must go back to the very first moments of indisposition ; to that chaotic state of the symptoms which existed before the disease had taken on itself any decided character. This period has been called the formative state of fever. We shall, then, divide the cure of fever into three periods

1. The formative state.
2. The stage of morbidly diminished action.
3. The stage of morbidly increased action.

On the formative State of Fever.

The formative state of fever is, in fact, the commencement of the stage of morbidly diminished action. We, however, choose to consider it separately from that stage ; because, the treatment in the two periods should be somewhat different, and, also, for the purpose of impressing the student with the high importance of attacking febrile action on its first appearance, without waiting for a regular development of its character.

In most cases of fever, there is a space of time from the very first approaches of indisposition, till the character of the fever is developed ; this is called the formative state of fever. In this period, the symptoms are a perfect chaos, and the most sagacious physician may not be able to decypher what character of fever is to

take place. The length of this period is very uncertain; it varies from an hour, or perhaps less, to several days. It is during this state, that the physician has the best chance of curing, or, rather, of preventing the disease.

There are a multitude of diseases and slight indispositions, particularly colds, that are accompanied with febrile action, in which no regular character of fever is ever formed. At the commencement of these complaints, their cure will fairly come under the treatment of the formative state of fever; because, under this head, we mean to treat, not only of the cure of the formative state of the three regular characters of fever, but also of the cure of the formative state of every species of febrile action. By this plan, the physician, when called to a patient labouring under febrile action, will not hesitate to prescribe, although no regular disease has developed itself.

On the Cure of the formative State of Fever.

In our reflections on this subject, we shall include the treatment of the early symptoms of every fever before it develops itself, and of every species of febrile action; yet not without a special reference to the character of the disease which may be expected to follow.

To judge of the character of fever which will probably be formed, we may consider,

1. The character of fever which, at that time, is most prevalent.
2. The character of fever to which the patient has been most liable.
3. The character of fever to which his recent exposures would subject him.
4. The character of fever that the symptoms mostly indicate.

After having decided on the character of the fever which is most likely to be formed in this particular patient, the cure is to be attempted by general remedies; yet not without a special reference, in the administration of each remedy, to the character of fever which you expect will succeed; and also, to that remedy which will most pro-

bably prove efficacious in this particular case : therefore, it will not be expected that all the means of cure hereafter named will be used, nor in the exact routine mentioned. We shall place them in the order in which they are generally prescribed by our best physicians.

PERSPIRATION. In most incipient cases of fever, and of febrile action, a gentle perspiration has a powerful effect in restoring health.

When a gentle and agreeable perspiration is produced over the whole body, you have evidence that the exhalent arteries, a very extensive class of vessels, have returned to the performance of their functions ; or, in other words, that they are in health. The quantity of fluid discharged may be of some consequence, when there is a fulness of the vessels ; but the great advantage to be derived from the perspiration, is the return of the exhalent arteries to the performance of their healthy action ; and the effect which such an immense number of vessels, distributed throughout every part of the body, and restored to their natural action, must have in influencing other parts to take a healthy action.

VOMITING. Vomiting is one of the most useful remedies in the formative state of fever. Not so much for the mere discharge of the contents of the stomach, as for the shock* which is given to the whole system.

PURGING. Cathartics have a considerable effect in removing the formative state of fever, by exciting many of the functions of the alimentary canal ; viz. its muscular motion, and the action of the exhalent arteries, and of the mucous and other glands situated on the canal and in its neighbourhood, by which, not only the contents of the canal are discharged, but also large quantities of serum, mucus, bile, &c.

BLOOD-LETTING. This should be practised in the formative state of fever, if there is nothing in the condition of the patient, nor in the probably ensuing character of fever, which forbids it. Blood-letting is one of the most powerful means of preventing the formation of fe-

* To use a figurative expression, it is like the blowing up of the magazine of fort Apalachicola, by sailing-master Bassett, with the first hot shot which was discharged at the fortress.

ver, especially of the inflammatory character ; because, the heart and arteries are here primarily affected, and the abstraction of their contents prevents them from taking on a morbid action.

ABLUTION. Doctor Currie has written a most valuable treatise on the effects of water in fever. There can be no question that the use of water, in all its forms, is highly advantageous in the formative state of fever. The particular manner in which it is to be applied, in each case, must rest upon the judgment of the physician.

MERCURIALIZATION. That affecting the system with mercury has often cured the formative state of fever, the united voices of Rush, Warren, and hundreds of other American physicians, can testify ; but, that it has destroyed many, our grave yards demonstrate.

BLISTERING. For local pains, blisters may be of advantage ; but no great dependence can be placed on them for interrupting the formative state of fever.

SINAPISMS, although useful, have less effect than blisters.

WINE, ALCOHOL, and other STIMULANTS, are sometimes found useful in peculiar cases.

OPIUM is occasionally administered with advantage.

Beside the foregoing remedies, there are a great variety of others in use among physicians, but the most important, the most powerful, have been named.

In the treatment of the formative state of fever, great judgment must be used in nicely adapting the cure to the exact state and condition of the patient. It must not be thought that all these remedies are to be used in every case ; no, the physician must have in view the character of fever which will probably be formed, the age, sex, condition, strength, &c. of his patient ; and he must nicely graduate his remedies according to all those circumstances. And notwithstanding a powerful onset is advised, the capability of the patient to support this shock must always be had in view, or he may be injured.

The chance of curing, or rather of cutting short the duration of fever in its formative state, or after it has completely developed its character, is as an hundred

to one. Hence the necessity of attacking every species of febrile action at its commencement, and with such powerful remedies as are most likely to destroy it, and prevent the formation of a fever.

Many European physicians are of opinion, that they never cut short the course of a fever, by remedies, after it has completely formed its character, and continue for three or four days. Some Americans hold a different opinion. Yet, how few physicians are there who attack the formative state of fever with vigour. Oft times have I seen some placebo administered to amuse the patient, while the fever should develope itself. Yea, I have known physicians refuse to do any thing in the formative state of fever, and thereby lose the best opportunity of curing the disease.

Cure of the Inflammatory Character of Fever.

It is of no small importance to the safety of the patient, that his physician should be able to ascertain, on the first moment of indisposition, that his patient is attacked with the inflammatory character of fever.

To decide this question, the following circumstances may be taken into consideration :

1. The character of fever to which the patient has been liable.
2. Is this attack similar to his former ones ?
3. The character of fever which prevails at that time.
4. The season of the year.
5. The age, sex, condition, temperament, habits, exposure, &c. of the patient.
6. The character of fever which is most strongly indicated by the symptoms.
7. Every other concomitant circumstance.

The cure of the inflammatory character of fever naturally resolves itself into two periods : the one, during the formative state of the fever, and through the stage of morbidly diminished action ; and the other, from the commencement of the stage of morbidly increased action, to the end of the disease.

We have already treated of the cure of the formative

state of fever in general ; but, if the remedies have not been successful during this state of the fever ; or, if none have been used, then a somewhat different, more definite, and more vigorous course, must be pursued.

Treatment of the inflammatory Character of Fever during its formative state, and through its stage of morbidly diminished action.

We shall presume it to be a pure, unmixed, simple case of the inflammatory character of fever, having no tendency to typhoid action.

The indications to be accomplished in this period of the disease are,

1. To remove the proximate cause of the inflammatory character of fever, viz. the very great diminution of the life of the muscular fibre.

2. To prevent the reaction of the heart.

It may be extremely difficult to decide, on abstract principles, the remedy which, in each particular case, ought to be first used. This must rest wholly on the judgment of the physician. We shall mention the remedies in the order in which they are most generally prescribed by our best physicians.

WARM BATH AND PERSPIRATION. If the physician is called at the first hour of the attack, and the symptoms should not be violent, the patient appearing only to have taken cold, pediluvium, semicupum, or general bathing in warm water, will often afford relief. The object now to be obtained is the removal of the proximate cause, i. e. to restore the very great diminution of the life of the muscular fibre. The bathing should be accompanied with friction, and motion of the limbs. General bathing, as being more extensive, is more efficacious, than a partial bath. It is the same with friction ; every part of the body should be well and repeatedly rubbed while in the bath. Immediately after bathing, perspiration should be promoted by warm teas, sudorifics, &c. If it should be gentle, agreeable, and nothing contraindicates, it may be kept up for six, twelve, or even twenty-four hours.

General bathing and friction are among the most pow-

erful and direct applications to the parts, which have been exposed to the remote cause of the disease, and which are, in part, the seat of the proximate cause, viz. the external muscles. It is not improbable, that warm bathing with friction, followed by a gentle perspiration, is the best means of restoring the diminished life of the muscular system.

EMETICS. Perhaps vomiting may be spoken of next after the warm bath and perspiration. The object in giving an emetic is to accomplish our first indication of cure.

The stomach and œsophagus are surrounded by powerful muscular membranes. The shock which is given to these membranes, and to the whole muscular system, when the emetic operates powerfully, is very great. Every fibre in the whole body is agitated, convulsed. It is principally from this effect on muscular structure, that we are to expect benefit from vomiting. Although we shall not pretend to say that the emetic drug produces no good effects by emptying the stomach, when by chance it shall be gorged with noxious matters, and in disposing to perspiration; yet, we affirm, that the salutary effects arise more from the concussion given to the muscular system, thereby breaking up any disposition to morbid action in the muscular fibre, than in discharging a few pints of the contents of the stomach.

BLOOD-LETTING. If the patient is of a very plethoric habit, and has been accustomed to lose blood, or if the symptoms strongly indicate blood-letting, it may be practised before either of the above-named remedies; and more especially, if the physician does not expect to visit the patient again in a few hours. The great objects to be obtained by blood-letting are,

1. To promote our first indication of cure, by unloading the vessels, particularly the minute arterial and venous ramifications, that they may more readily perform their functions, and thereby assist in restoring the diminished life of the muscular fibre.

2. To accomplish our second indication, by preventing the reaction of the heart.

We are now speaking of a period prior to the morbidly increased action of the heart and arteries; there-

fore, we cannot be guided in the necessity of blood-letting by the preternatural fulness of the pulse ; nor in the quantity to be taken, by the buffy appearance of the blood. A full bleeding, from a large orifice, should always be practised, or such a quantity should be taken as the patient, under present circumstances, can, with perfect safety, bear to lose.

PURGING. The intention of purging is, to assist in removing the proximate cause, by exciting, to an unusual degree, the natural action of the whole tract of the alimentary canal, and that of all the exhalent arteries which open into it, and of all the glands which have the same outlet. Therefore, we do not prescribe cathartics, because we expect there is a quantity of sordes in the alimentary canal.

ABLUTION. Spunging, sprinkling, or washing the whole body, or such parts as are preternaturally hot, with cold water, or vinegar and water, has been found of eminent service, by Dr. Currie, and others. The object would seem to be, rather to allay a local symptom, than to answer either of our leading indications.

COLD WATER. It is supposed, that fever has often been prevented, or cured, by drinking large quantities of cold water, or cold acidulated drinks. Perhaps both ablution and cold drinks may have a tendency to prevent the violent reaction of the heart.

BLISTERS, SINAPISMS, CUPPING, and other remedies, should be used to combat local symptoms.

The apartment of the sick should be kept perfectly clean, cool, well ventilated, and free from noise. No visitor should be admitted into his chamber ; every person should be excluded, except his immediate attendants. The patient must avoid conversation ; no person should be allowed to speak to him, except the physician and the nurse ; and they should hold no further conversation with him, than to understand his disease, and administer to his wants. He should take no food, or next akin to none ; a little thin gruel might be allowed, but nothing solid. The exercise of both body and mind must be avoided. He must be abstracted from every thing like business ; as also from fixed attention to any subject.

The duration of the formative state of the inflamma-

tory character of fever is so short ; the stage of morbidly diminished action so soon over ; and the physician so seldom called in season, that an opportunity to prescribe many of the above remedies does not often occur. It will, therefore, be obvious, that the prescriptions must follow each other in pretty rapid succession. When the system has recovered a little from the impression produced by one remedy, another may be administered. They may be repeated, if occasion should require.

Cure of the inflammatory character of fever, from the commencement of the stage of morbidly increased action, to the end of the disease.

If the patient shall not have been seen by his physician before the hot stage commences ; or the remedies have not been successful, then a different indication presents itself ; which is,

To overcome the reaction of the heart.

In this one point is concentrated the disease. The sheet-anchor of our hope is the lancet. A large vein should be opened with a free orifice, and so much blood drawn as will reduce the pulse to the standard of health. It is impossible to name the quantity which will be requisite in every case ; from twelve to thirty-six ounces may be taken ; and even a larger bleeding may be practised, if the pulse does not yield. The only criterion is, to reduce the pulse to its common standard.* If it rise again in three, six, twelve, or twenty-four hours, a second bleeding should be prescribed.

Twelve ounces of blood, taken from a large orifice in a full stream, has more effect in relieving the minute arterial and venous ramifications from their engorgement, than thrice that quantity, drawn in a small trickling stream ; because, when the blood does not flow freely, the large veins and arteries have an opportunity of gradually contracting upon their remaining contents as fast as the blood is abstracted ; and the minute arterial and venous ramifications remain gorged with blood. But, if the blood is drawn in a full stream, those vessels have an opportunity, with the larger ones, of contracting and

disgorging their contents, thus preventing organic lesions in the vital and other organs.

The ravages which the disease is making in the system, arise more from the engorgement of the minute arterial and venous ramifications, than from the plenitude of the large vessels.

If the pulse rises a third, fourth, fifth, or more times, and, especially, if the last drawn blood is covered with an inflammatory crust, the pulse must be reduced by the lancet; because the only safety for the patient is, in keeping under the violence of reaction. The number of bleedings, and the quantity of blood to be drawn at each time, must depend entirely on the pulse. It must, however, be taken into consideration, that the inflammatory character of fever is seldom cured by one bleeding; and, that a less quantity of blood will probably reduce the pulse, at a third or fourth bleeding, than at the first or second. The physician must also have in view the inflammatory appearances of the last drawn blood, and the quantity of blood which his patient can bear to lose, without injuring his constitution.

The plan of treatment, to overcome the reaction of the heart, is founded on this principle: that the reaction is produced and kept up by an increase in the quantity, or of the stimulating quality of the blood within the heart, acting upon its muscular structure. Reaction alone is the grand overruling symptom in this stage of the disease; therefore, so much blood must be drawn, as will subdue the reaction, if it can be done with safety.

As soon after the first bleeding as the patient has recovered a little from its immediate effects, say within an hour, there should be given a solution of tartrite of antimony. If the patient have not previously taken an emetic, or not within the last twenty-four hours, it should be given in such quantities as to produce three or four full vomitings; after which, or, in case the patient had recently taken an emetic, the solution of tartrite of antimony should be given in such divided and repeated doses, as to keep up an almost uninterrupted nausea, dispose to perspiration, and produce three or four copious watry stools.

The objects are, to unload the stomach, to give a shock to the body, and so completely to prostrate the strength of the whole muscular system, that the heart shall not have left sufficient muscular force to produce reaction. The discharging of the contents of the stomach, and the concussion given by vomiting, have already been explained. The prostration of the strength of the muscles of the alimentary canal, and, consequently, of the whole muscular system, by the nauseating effects of the tartrite of antimony on the esophagus and stomach ; and by its purgative effects on the intestines, is astonishingly great. A Sampson, who could ordinarily overturn temples by his mere muscular strength, cannot, while labouring under the powerfully nauseating effects of the tartrite of antimony, lift his hand to his head. There is no remedy, if we except blood-letting, which has so lasting and powerful effects in prostrating the muscular powers of the heart, and overcoming its reaction, as the preparations of antimony. Nausea should be kept up for twelve or more hours, out of every twenty-four, if nothing contra indicates.

The grand indication which we have in view, is to overcome the reaction of the heart, and prevent its recurrence. The lancet and tartrite of antimony are our shield and helmet. While we are practising these remedies for two or three days, the combatting of local symptoms must not be omitted. Blisters, sinapisms, local bathing, cold and warm ; drinking of ptisans, cold water, &c. may be prescribed.

If the physician should not have been so fortunate, by the end of the second or third day after the first hot fit, as to have overcome the fever, he must be contented to let it run its course, and endeavour to conduct his patient safely through the remaining part of his sickness, with the least possible injury to his constitution. This will be best accomplished by alleviating the symptoms as they appear ; always bearing in mind, that most of those symptoms, if not all of them, arise, either directly or indirectly, from the morbidly increased action of the heart.

The inflammatory character of fever will generally terminate critically on the fifth, seventh, ninth, or four-

teenth day ; and to this object our attention must be directed.

An unfavourable issue must be apprehended, if the attack is very violent, and the symptoms obstinately resist all remedies ; and more especially if typhoid symptoms supervene.

The circumstances indicating a favourable crisis, are, a less violent attack, an easy subduction of the symptoms ; and, if on or about either of the critical days, a spontaneous perspiration, diarrhoea, hæmorrhage, or copious deposit from the urine takes place, accompanied with a mitigation of the symptoms. These evacuations are not the concocted matter of the fever thrown off, as was once supposed ; but the earliest evidence of a change having taken place in the system. If this change is a complete overthrow of the fever, all the symptoms will probably appear mitigated ; but if it be the triumph of death, most of them will be increased.

Symptoms are the effects of the disease made manifest, through the functions, or morbid actions of the several organs and parts of the body : consequently, every organ, and every part of the body must experience the effect of a change in health, or in disease, before it becomes apparent to the most sagacious physician. These early changes in the action of the heart, brain, tongue, skin, the alimentary canal, the exhalent arteries, and the kidneys, produce a soft equable pulse ; agreeable sensations ; a moist tongue, with a change in the fur on the sides ; a healthy, pleasant, and agreeable perspiration ; a natural and salutary discharge of offensive matters from the alimentary canal ; sometimes a flow of blood from the debilitated exhalents of the nose, or other parts ; an abundant discharge of urine, affording a copious deposit of lateritious sediment, &c. It is perfectly evident that a change must have taken place in the action of the organ itself, before any alteration could have taken place in its excretions.

During the cure, the patient must avoid every kind of animal food, even animal broths. He must eat nothing but weak gruel, barley or rice-water, sago, arrowroot, &c. Solid food of every kind must be proscribed.

Immediately on a favourable crisis taking place, the

patient should be offered the aromatic sulphuric acid, (elixir vitriol,) and water. If in danger of sinking, during the remittance of fever, he may be allowed a small quantity of some delicate cordial; and if absolutely necessary, a small quantity of the infusion, or decoction of Peruvian bark. When the patient has passed the period for the second paroxysm since the crisis, and that without much fever, he may be allowed a more liberal use of the infusion, or decoction of bark, with small quantities of animal broth. The patient's bowels must be opened every other day.

The inflammatory character of fever has generally one paroxysm in each twenty-four hours; that of every other day is, usually, the most violent. These paroxysms recur several times after the crisis is formed, but with diminished violence. The depleting remedies are used to the most advantage, at the approach of the paroxysm, and the invigorating, during the stage of apyrexia.

It must be distinctly understood, that we have been treating of a highly inflammatory character of fever; in which there is not only no prospect, but, in fact, no possibility of its running into typhus.

I am inclined to think that this character of fever occurs more frequently in America than on the Eastern continent.

The treatment which we have recommended is decided, energetic, and adapted for a vigorous constitution. In all cases, however, allowance must be made for the age, sex, condition, &c. of the patient.

It will be readily perceived that we have most faithfully drawn our mode of treatment from the seat, and proximate cause of the fever.

The seat of the inflammatory character of fever we have shown to be in the muscular structure; and the proximate cause, a very great diminution of the life of the muscular fibre.

Our first suit of remedies is applied, as directly as possible, to the muscular structure, with a view of restoring its diminished life. Since the circulating system exercises an overruling power upon the whole of the body, and that power is supported by the muscular-

ity of the heart ; it is to this point, that our attention is called in the second place ; and, lastly, to subdue local symptoms as they arise.

It is worthy of note, that the mode of cure, drawn as faithfully from the seat and proximate cause, as though the writer had never seen the disease, nor read any other than Thomas's description of it, should correspond so exactly with the treatment which has been found the most successful by every judicious practitioner, from the days of Hippocrates, whatever his theory of the disease might have been. This single circumstance is a powerful reason for believing that the true seat and proximate cause has been discovered. Another reason for the same opinion is, that when the writer commenced this investigation, he had a very different theory of fever, its seat, and proximate cause ; but he was irresistibly led to this inference, from the weight of testimony, as he proceeded.

We do not pretend to have discovered, or even introduced any new remedies ; but we think we have shown the rationale of the old ones. Have we not explained, in the most satisfactory manner, the reason that the various preparations of antimony have been found so efficacious in fever ; and pointed out more definitively the objects to be accomplished in the several periods of the disease ? We think that we shall have given to the practitioner a confidence in his own powers ; an object to be obtained in every period of the disease, and the best means by which it may be accomplished.

Med. Hist.

WZ

270

5734r

1818

C.I

